① Factor

(a) $2x^2+14x+20$

(b) $6x^2+2x-8$

② Given the vertex $(-1, 4)$ and another point, $(1, -4)$ find the polynomial, vertex, and factored forms of the quadratic.

③ Sketch w/o a calculator $f(x)=\frac{1}{3}(x+1)(x-2)^2$

① Factor

(a) $2x^2+14x+20$

$1\cdot 2$ $\quad 2\cdot 7$ $\quad 1\cdot 20$

$1\cdot 14$ $\quad 2\cdot 10$

$4\cdot 5$

$(2x+4)(x+5)$

$(x+2)(2x+10)$

(b) $6x^2+2x-8$

$1\cdot 6$ $\quad 1\cdot 2$ $\quad -1\cdot 8$

$-2\cdot 4$

$2\cdot 3$ $\quad 1\cdot -8$

$2\cdot -4$

$(3x+4)(2x-2)$ ✓

$(6x+8)(x-1)$

Multiply Add Rewrite Factor

$2x^2 + 14x + 20$

① Mult $a \cdot c$ $\quad 2 \cdot 20 = 40$

$1 \cdot 40$
$2 \cdot 20$
$8 \cdot 5$
$4 \cdot 10$

② Add to b-term

$4, 10$

③ $2x^2 + 4x + 10x + 20$

④ Pull out the common factors

$2x(x+2) + 10(x+2)$

$(x+2)(2x+10)$

② Given the vertex $(-1, 4)$ and another point, $(1, -4)$ find the polynomial, vertex, and factored forms of the quadratic.

$y = a(x-h)^2 + k$

$y = a(x+1)^2 + 4$

$-4 = a(1+1)^2 + 4$

$-4 = 4a + 4$

$-4 \quad -4$

$\frac{-8}{4} = \frac{4a}{4} \quad a = -2$

$y = -2(x+1)^2 + 4$

$y = -2(x+1)(x+1) + 4$

$-2(x^2 + 2x + 1) + 4$

$-2x^2 - 4x - 2 + 4$

$-2x^2 - 4x + 2$

$y = -2(x+1)^2 + 4$

$0 = -2(x+1)^2 + 4$

$-4 \quad -4$

$\frac{-4}{-2} = \frac{-2(x+1)^2}{-2}$

$\sqrt{2} = \sqrt{(x+1)^2}$

$\pm\sqrt{2} = x + 1$

$X = \pm\sqrt{2} - 1$

$y = a(x - R_1)(x - R_2)$

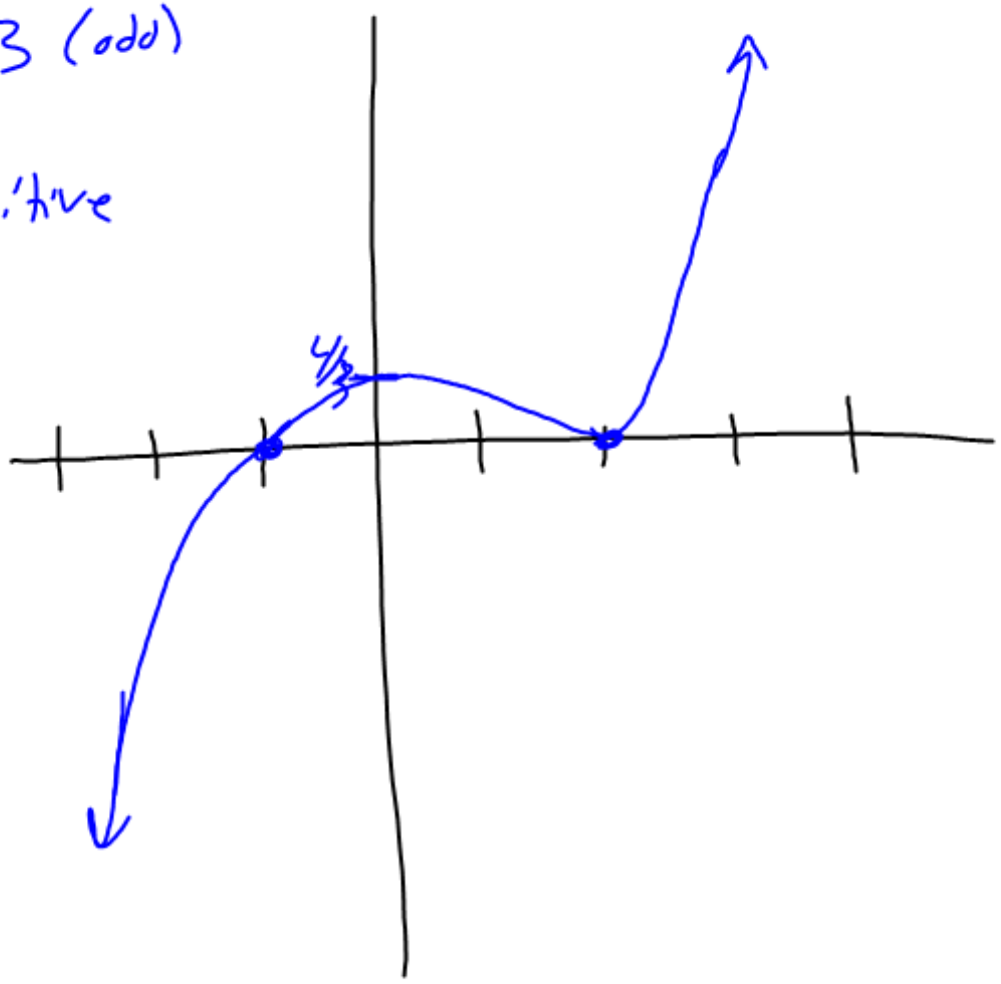
$y = -2\left(x - (\sqrt{2} - 1)\right)\left(x - (-\sqrt{2} - 1)\right)$

③ Sketch w/o a calculator $f(x) = \frac{1}{3}(x+1)^1(x-2)^2$

cross bounce

degree: 3 (odd)

L.C. positive



32

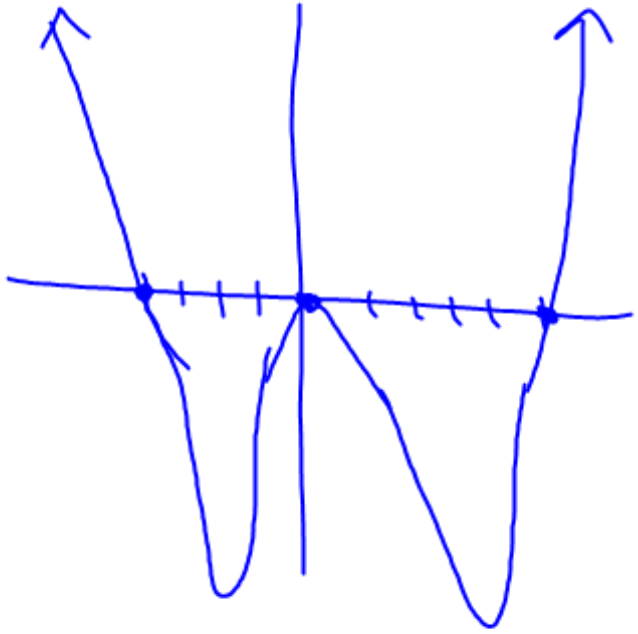
$x^4 - x^3 - 20x^2$

$0 = x^2(x^2 - x - 20)$

$x^2(x-5)(x+4) \rightarrow (x)(x)(x-5)(x+4)$

$0, 0 \quad 5 \quad -4$

degree 4



(35)

$3x^2 - 12x + 3$

$$x = \frac{12 \pm \sqrt{144 - 4(3)(3)}}{6}$$

$$x = \frac{12 \pm \sqrt{108}}{6} \Longrightarrow \frac{12 \pm \sqrt{27} \cdot \sqrt{4}}{6} = \frac{12 \pm \sqrt{9} \cdot \sqrt{3} \cdot \sqrt{4}}{6}$$

$$= \frac{12 \pm 6\sqrt{3}}{6} = \boxed{2 \pm \sqrt{3}}$$

Factor

$x^4 - x^2 - 6$

$x^2 - x - 6$

$(x^2-3)(x^2+2)$

$x^8 - x^4 - 6$

$(\quad)(\quad)$

$0 = \frac{1}{4}(x)^3(x^2-9)$

$0 \quad (x-3)(x+3)$

$3 \quad -3$

Sect. 2.2

#39, 40, 42, 45, 49, 53-60(2), 61-72(2)